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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/551,728

10/03/2005

Chandan Saha

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5802

109 7590 09/11/2008

The Dow Chemical Company
Intellectual Property Section
P.O. Box 1967
Midland, MI 48641-1967

EXAMINER

PARVINI, PEGAH

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

09/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/551,728 | Applicant(s) SAHA ET AL. | |
| | Examiner PEGAH PARVINI | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-11 and 33-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-11 and 33-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application Publication No. 2001/0038810 to Wallin et al. in view of US Patent Application Publication No. 2002/0095871 to McArdle et al.

Regarding claims 6 and 7, Wallin et al. teach porous ceramic grains which are substantially acicular in which an element such as Ce, Mg, Ca, iron, scandium, etc. may be incorporated into the lattice structure of the catalyst (paragraphs [0024], [0025], [0028], [0031], [0032]). Furthermore, Wallin et al. teach the use of precursor compounds such as clay, zeolites, alumina, silica, aluminum trifluoride, and fluorotopaz in the mixture when forming mullite porous catalyst support ([0045]). It is, further, noted that Wallin et al. disclose that in making such a porous catalyst support, precursor compounds are generally mixed, then shaped into a porous shape by any suitable method, and then is heated sufficiently to form the acicular ceramic grains of the support ([0043] to [0048]). In addition, Wallin et al. points to the fact that when the

Art Unit: 1793

support is mullite, the precursor compounds contain Al, Si, and oxygen which are mixed to form a mixture capable of forming fluorotopaz and substantially mullite ([0043]). The mixture is heated under an atmosphere sufficient to form the porous catalyst support in the presence of fluorine, which is provided through the SiF_4 source ([0048]). Wallin et al. also disclose that the metal elements are chemically bounded to the ceramic grains of the porous catalyst ([0037]). Additionally, Wallin et al. disclose that the acicular ceramic grains have a porosity of at least about 40 percent by volume ([0029]). Furthermore, Wallin et al., in an example, disclose the use of platinum oxide in a very small amount of 0.84 gram per liter ([0061]).

Wallin et al. do not disclose the use of talc.

McArdle et al., drawn to making ceramic aggregate particles, disclose the use of silicates such as talc as one type of filler to affect the properties of the ceramic aggregate precursor particles ([0002], [0047], [0053]).

Thus, it would have been obvious to one of ordinary skill in the art to modify Wallin et al. in order to include talc as that taught by McArdle et al. motivated by the fact that fillers such as talc affect properties of ceramics such as hardness, porosity level, wear behavior, and more ([0053]).

With reference to the limitation directed to an improved thermal shock factor, it is noted that the references, as combined, disclose a similar process of making porous acicular mullite composition; therefore, the property of improved thermal shock factor is expected to follow from the composition and method obtained from the combination of references absence evidence to the contrary.

Claims 8-11 and 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin et al. in view of US Patent No. 4,526,886 to Joy, III.

Regarding claims 8-11 and 33-34, Wallin et al. teach porous ceramic grains which are substantially acicular in which an element such as Ce, Mg, Ca, iron, scandium, etc. may be incorporated into the lattice structure of the catalyst (paragraphs [0024], [0025], [0028], [0031], [0032]). Furthermore, Wallin et al. teach the use of precursor compounds such as clay, zeolites, alumina, silica, aluminum trifluoride, and fluorotopaz in the mixture when forming mullite porous catalyst support ([0045]). It is, further, noted that Wallin et al. disclose that in making such a porous catalyst support, precursor compounds are generally mixed, then shaped into a porous shape by any suitable method, and then is heated sufficiently to form the acicular ceramic grains of the support ([0043] to [0048]). In addition, Wallin et al. points to the fact that when the support is mullite, the precursor compounds contain Al, Si, and oxygen which are mixed to form a mixture capable of forming fluorotopaz and substantially mullite ([0043]). The mixture is heated under an atmosphere sufficient to form the porous catalyst support in the presence of fluorine, which is provided through the SiF₄ source ([0048]). Wallin et al., also, disclose that the metal elements are chemically bounded to the ceramic grains of the porous catalyst ([0037]). Additionally, Wallin et al. disclose that the acicular ceramic grains have a porosity of at least about 40 percent by volume ([0029]).

Art Unit: 1793

Furthermore, Wallin et al., in an example, disclose the use of platinum oxide in a very small amount of 0.84 gram per liter ([0061]).

Although Wallin et al. does not expressly disclose any of the other disclosed property enhancing compounds ([0031]-[0032]) which are mostly claimed in the instant application, it would have been obvious to a person of ordinary skill in the art to have used a different property enhancing compound and/or a combination of them motivated by the fact that Wallin et al. disclose a number of different metal catalysts and disclose the possibility of using a combination of them ([0031]-[0032]); additionally, the fact that Wallin et al. has only used one of such metals in their example does not suggest that other metals, disclosed for the same purpose by the same reference, are not suitable.

Wallin et al. although disclosing a wide variety of catalyst metals, is silent to the use of magnesium and neodymium and the ratio of the two metals (Nd/Mg) and silent to the ratio of Fe/Mg.

Joy, III., drawn to catalyst composites used to treat gaseous waste of internal combustion engines such as that of automobiles exhaust gas, disclose that said catalyst comprises platinum and/or palladium and, further, 0.01 to 25 wt.% of one or more base metals such as magnesium, iron, and neodymium (Abstract; column 1, lines 26-33; column 2, lines 20-50). Furthermore, Joy, III. discloses that in automobile exhaust gas where dimensional and structural stability is particularly desirable, the most preferred substrates are ceramic materials such as mullite (column 5, lines 52-68).

It should be noted that while Joy, III. does not expressly disclose a weight ratio of 0.1 to 10 for Nd/Mg, it discloses a range of 0.01 to 25 wt.%, based on the total metal

Art Unit: 1793

content, of each one of them being present in the catalyst; thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have utilized, in the composition of Wallin, a content of Nd and Mg within the claimed range so to obtain a ratio within 0.1 to 10 wt% or a ratio which would have an overlapping range with the one instantly claimed motivated by the fact that Joy, III. discloses amounts of each metals in a way that once the ratio of Nd/Mg is taken, it would result in overlapping ranges of ratios of Nd/Mg with the one instantly claimed, and overlapping ranges have been held to establish *prima facie* obviousness. MPEP § 2144.05. In addition, such base metals contribute to physical and/or thermal stability of the catalyst (column 2, lines 25-31, 33-36).

With reference to the limitation directed to an improved thermal shock factor, it is noted that the references, as combined, disclose a similar process of making porous acicular mullite composition; therefore, the property of improved thermal shock factor is expected to follow from the composition and method obtained from the combination of references, absence evidence to the contrary.

Regarding new claims 35-37, Wallin et al., as detailed out above, disclose that there exists grain boundaries between the grains ([0027]), and it is noted that while the grains are spread throughout the mullite, the grain boundaries are spread throughout the mullite as well; therefore, it is expected that at least part of the property enhancing

Art Unit: 1793

compound is incorporated into the grain boundaries interface absence evidence showing the contrary.

Response to Amendment

Applicants' amendments to claims 6, 8, 11, and 33, filed June 4, 2008 are acknowledged. However, said amendments do not place the application in condition for allowance.

Response to Arguments

Applicants' arguments, see page 5, filed April 29, 2008, with respect to the objection made to claim 7 have been fully considered and are persuasive. The objection of claim 7 has been withdrawn.

Applicants' arguments filed April 29, 2008 have been fully considered but they are not persuasive.

Applicants have argued that McArdle et al. only describes talc among other ceramics as a filler and a filler is an inert mineral powder; thus, the combination of McArdle et al. into Wallin et al. is not proper.

The Examiner, respectfully, submits that as detailed in the previous Office Action, talc affect properties such as hardness, porosity level, wear behavior, etc. Although Applicants seems to argue that since talc utilized in McArdle et al. is a filler, thus, it is an

Art Unit: 1793

inert mineral powder, it is noted that such effect or property is not recited in the instant claims. In other words, the instant claims recite forming a mixture comprising talc used in making acicular mullite composition. It is to be noted that Wallin et al., as detailed in the previous Office Action and above, is drawn to making porous mullite composition used as catalyst. In addition, motivation has been indicated as why to use talc in ceramic mixtures.

Applicants have argued that McArdle et al. in view of Wallin et al. does not teach a mullite composition comprised substantially of acicular mullite grains that are essentially chemically bound wherein the property enhancing compound reacts and is incorporated into the grain boundary interface amorphous phase.

The Examiner, respectfully, submits that Wallin et al. disclose that there exists a grain boundary between the grains ([0027]), and while grains are spread throughout the catalyst, the grain boundaries are expected to have spread out throughout the catalyst too; thus, it would be expected to have at least some of the property enhancing compound being incorporated into the grain boundary interface absence evidence to the contrary. Applicants show no evidence to the contrary.

It is, also, to be noted that the process of making mullite is done under heat and fluorine sufficient to make such a reaction formed mullite as detailed out previously in paragraphs [0043] and [0048].

Art Unit: 1793

With reference to Applicants' arguments on the functionality of elements such as Pt utilized as catalysts and the combination of metal elements, it is to be noted that Wallin et al. disclose the possibility of using a combination of metal elements in paragraph [0032] which refers to the metals in paragraph [0031] as well.

Since the example used in the previous Office Action didn't expressly utilize a combination of metals, Applicants, in the previous reply, had argued that the references did not disclose a combination of metals (Applicants had argued that claim 8 is novel in that Wallin et al. fail to disclose any particular combination of elements useful for a catalyst for any other reason). This is not persuasive because the Examiner, in the previous Office Action (2nd Non-Final) was pointing to the fact that although the cited example did not disclose a combination of metals, the fact that the disclosure in the broader sense opens the possibility of having such a combination would make it obvious to use a combination of metals in the mullite. This intention would have been obvious by following the second paragraph of page 5 of the previous Office Action to the end, where the Examiner, pointed out "The fact that Wallin et al. has only used one of such metals in their example does not suggest that other metals, disclosed for the same purpose by the same reference, are not suitable".

With reference to Applicants' argument that the newly added limitation of "improved thermal shock factor" would make the claims novel, it is noted that this is a property, and while the combination of references as detailed above disclose a similar

Art Unit: 1793

composition and process of making the same, said property is expected to follow from the disclosed composition absence evidence to the contrary.

Furthermore, it is noted that no tangible evidence has been provided to show improved thermal shock factor of mullite or any effective results of the claimed invention having the claimed features including the specified ratio of Nd/Mg over the combination of references as detailed above.

With reference to Applicants' argument relating to Joy III and the particular combination of elements of compounds as catalyst, it is, respectfully, submitted that in addition to a request to submit a tangible proof or evidence, said reference is utilized in a 103 obviousness rejection because of this reference provides teachings on the use of Mg and Nd and their amounts in a way that results in a ratio of Nd/Mg which would have overlapping ranges with the ratio instantly claimed. It is noted that overlapping ranges have been held to establish *prima facie* obviousness. MPEP § 2144.05.

Furthermore, Joy, III discloses that magnesium and neodymium which the reference refers to them as some of the base metals contribute to the physical and/or thermal stability (column 2, lines 33-50).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 1793

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pegah Parvini whose telephone number is 571-272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. P./
Examiner, Art Unit 1793

/Michael A Marcheschi/
Primary Examiner, Art Unit 1793